Our Mission ▶ Your Health

DIABETES INSTITUTE

Diabetes In-control NOW!

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Letter from the Director of the Diabetes Institute

Dear Readers,

I am delighted to welcome you back to Diabetes In-control NOW!

Our mission is to help you manage your diabetes, prevent complications, and live a long and healthy life. In this issue, along with current and helpful diabetes news and information, we have added two new features. In one new section, All about You, we have included a personal story from one of our Diabetes Self Management Education (DSME) graduates. This is the first of many such stories. If you have had success with a particular aspect of diabetes self management or have a question that we have not answered, please call or write us. Another special section highlights the research opportunities that are available in the Diabetes Institute. Although you may not derive an immediate benefit from participating, research frequently provides information that enhances our understanding of diabetes and/or demonstrates new or improved methods of treating diabetes.

This issue of Diabetes In-control NOW! focuses on blood glucose monitoring. You may be wondering why we chose to devote a significant portion of the newsletter to a topic such as monitoring. Is it really that important? We think so. Did you know that diabetes is one of the few diseases that you can get instant feedback about how the food you eat or the walk you take affects your blood sugar? Testing blood sugar levels is one of the most important things people with diabetes can do to help manage their disease and live a healthy lifestyle.

Unfortunately, if you do not test your blood sugar as often as your provider or educator recommends, you are not alone. A recent survey of 1,002 adults with type 1 and type 2 diabetes indicated that almost 4 out of 10 do not test as often as their health care provider recommends. Barriers to testing included having to prick a finger more than once, pain or discomfort at the testing site, possible inaccuracy of test result, and difficulty obtaining a large enough drop of blood.

Many scientists and researchers are developing blood glucose meters that require a smaller sample of blood, use a tinier needle to obtain blood, and provide results much more quickly. Also on the horizon are methods to test blood sugar levels that do not require a fingerstick. In the meantime, however, self blood glucose monitoring remains one of the most important tools you have to manage diabetes. Read the article on page 2 to learn how you can make blood glucose monitoring work for you.

All of us at the Diabetes Institute hope you are having a wonderful summer and look forward to seeing you soon!

Sincerely,

Robert A. Vigersky, COL, MC

Why Monitor

Susan Walker, RN, CDE

Perhaps you have read or heard that type 2 diabetes and obesity have reached epidemic proportions in the United States and in the world. One physician recently described it as an explosion. Nearly 21 million people in the United States have diabetes. Between 90 and 95 % have type 2 diabetes, the type that is more influenced by life style. 41 million people have pre-diabetes and may not know it. Pre-diabetes, when diagnosed, is an opportunity to make modest changes in one's diet or activity level that may prevent or delay the onset of type 2 diabetes. However, whether you have pre-diabetes or diabetes, monitoring your blood glucose (BG) levels on a regular basis is one of the best tools you have to understand the effect of different foods and activities on your BG levels.

Achieving glucose control is not easy. But it IS worth it. It can save your sight. It can save your kidneys. It can save your limbs. And it can save your life. If good glucose control has that many benefits, why do so few people with diabetes achieve it? According to the U. S. Centers for Disease Control and Prevention (CDC), fewer than 45% of Americans with diabetes are achieving a level of glucose control that will minimize the risk of developing the complications of diabetes. During the summer of 2005, GFK Market Measures conducted in-depth telephone interviews with 2,008 individuals with diabetes in the U. S. 1,767.04 (88%) respondents stated that they test their blood sugar regularly. 1,747 (87%), however, reported that they would like to be in better control of their disease. Table 1 shows the percent of people on pills, pills and/or insulin, and diet and exercise alone.

Another survey asked more than 1000 patients with diabetes why they do not test their blood sugars as often as their educators and providers tell them. We asked some of our patients to tell us what they find the most difficult aspect of testing blood sugar. You can probably predict their responses:

1. Having to repeat the fingerstick
2. Painful
3. Wondering if the test result is really accurate
4. Difficulty obtaining a large enough sample of blood
5. Having to retest due to an error message
6. Working hard to do everything right and blood sugars remain higher than target blood sugar levels.

Table 1. Percent of People on Different Treatment Therapies for Type 2 Diabetes.

Treatment	Percent of people with type 2 diabetes
Pills	61%
Insulin or insulin and pills	30%
Diet and exercise	9%

Monitoring your blood glucose tells you how your body is responding to certain foods, activities, and medications. With this information you will be better equipped to manage your medication, meal, and exercise plans to meet your target BG levels. Meeting your target BG levels is one of the best ways to reduce your risk of developing the complications of diabetes. Perhaps you already have some of the complications of diabetes. Should you just throw up your hands and declare defeat? *NO, NO, NO!* Meeting your target goals can stop the progression of disease and, in some cases, even reverse the damage. It is never too late to do the right thing! As the great statesman, Winston Churchill once said, "Never, never, never, never give up."

Six Steps to Proper Monitoring

1. Know your blood glucose target

Blood sugar targets vary from person to person and can even vary in the same person over time. Although it is important to work with your provider to determine what your target blood sugar range should be, the American Diabetes Association (ADA) recommended guidelines are shown in Table 2.

2. Learn how to check your glucose properly

The pads of our fingers are really the 'work horses' of the fingers. There are many nerves that enable the pads to perform all the things we ask them to do, but these same nerves are also very sensitive to pain. The ends of the fingers have fewer nerves and a better blood supply. Therefore, when you need a drop of blood, pricking the end of your finger will usually produce a larger drop of blood with less pain. Using the entire fingertip minimizes the soreness that may occur if you use the same spot over and over. It is important to use all of your fingers and not just a favorite few. If you find

Table 2. ADA Recommended Target Blood Sugar Levels for Non-Pregnant Adults

ADA Guidelines	Normal	Target Range for People with Diabetes
Average pre-meal glucose (mg/dL)	< 100	90-130
Average post-meal glucose (mg/dL)	< 110	< 180

pricking some fingers is more painful than others, try decreasing the depth of your lancing device. Talk to your diabetes provider or educator if you do not know the best depth for you. Do you do all of these things and still have trouble getting a large enough drop of blood? Try the following steps to obtain a good glucose sample every time:

a) Do not use test strips that have passed their expiration date
b) Allow your hand to dangle below the level of your heart for one to two minutes.
c) Wash your hands with warm water and soap. Even small amounts of food or sugar on your fingers can affect your results.
d) Adjust the depth of the lancets as needed-not all fingers require the same depth.
e) If you have difficulty obtaining a large enough drop of blood, gently milk your finger from its base to the tip before you stick your finger.
f) Change your lancets frequently enough to keep them sharp.

3. Decide when to check your glucose levels

Blood glucose levels are affected by many factors, some of which such as medications, food, exercise, illness, or stress are more obvious than others. Other normal physiologic events, however, may cause your blood sugar to vary at different times during the day and night. Therefore, it is important to check your blood glucose at different times rather than the same time every day. It is always a good idea to test your BG first thing in the morning. If you check it one other time during the day, but test a different time each day of the week, within a few weeks you will have a better understanding of how your BG may vary each day. Table 3 is an example of different times to test glucose levels.This is only a suggestion, but it gives you an idea of how you can better understand your BG range at different times of the day with only two fingersticks/day. Ask your provider about the best times to check your BG. It is frequently dependent on the diabetes medications you are taking.

4. Identify glucose patterns

Once you have tested your BG at different times, you may begin to see patterns. Is there a certain time of day or day of the week when your BG is higher or lower than your target range? Are there certain activities that cause your BG to be higher or lower than your target range? In the same way, identify the times when you are meeting your BG goals and what you are doing that enables you to meet them.

5. Determine what causes your BG changes

Once you have identified patterns or even an occasional high or low BG, try to identify what caused it. High BG levels may occur if you do not take your medication as prescribed, eat too much, are ill, or exercise less than usual. Low BG levels may result if you do not eat enough or at your usual time or you exercise longer or more vigorously than usual.

6. Decide what to do to get your BG levels back on target.

If you have gotten off track it is important to remember two things. No one is perfect and no one does everything right every time. Don't beat yourself up!!! Just get back on track.

The fall issue of Diabetes In-control NOW! will have more practical tips about the use of blood glucose meters. In the meantime, perhaps you can incorporate some of the preceding suggestions into your diabetes care routine. Aren't you more than worth the 1-2 minutes it takes for you to check your BG? We think so!

Table 3

Sun	Mon	Tues	Wed	Thurs	Friday	Sat
First thing in the morning	First thing in the morning	First thing in the morning	First thing in the morning	First thing in the morning	First thing in the morning	First thing in the morning
Before lunch	2 hours after lunch	Before dinner	2 hours after dinner	Before bed	Before or after exercise	Any time of day

Hand in Hand

Monitoring Blood Glucose and Counting Carbohydrate

Asha Jain MA, RD, CDE
Wellness Services, WRAMC, 202-782-1773

Why count carbs?

Counting carbohydrates or "carbs" is a simple method that provides flexibility and variety in planning and enjoying healthy, well-balanced meals.

As you know, the body converts the food we eat into the energy the body needs to function. Food may be used for energy immediately or it may be stored for later use. Food also has an impact on blood glucose (BG) levels. Of the three major nutrients, carbohydrates, protein, and fat, carbohydrates have the largest impact on blood glucose.

Carb counting, therefore, is an effective way for people with diabetes to manage their BG levels.

Why are carbs so important?

Let's review the importance of carbohydrates. Carbohydrates are the body's primary source of energy. In order to keep our bodies healthy and working well, we need to eat a similar amount of carbohydrates every day. The more consistent we are with the amounts and the times of our meals or snacks, the easier it is to keep BG levels in a healthy range (90-180). Foods that are rich in carbohydrates are starchy vegetables (such as potatoes, peas, and corn), breads, grains, fruits, and milk. Non-starchy vegetables such as celery, onions, and many green vegetables contain very little carbohydrates. Since non-starchy vegetables have a very small effect on blood glucose they are considered free foods and do not need to be counted. Simple carbohydrates, however, such as sugar, honey, jams/jelly, syrups, molasses, juices, and soda, are high in carbs and must be counted as part of the total number of carbohydrates eaten with a meal or snack. Simple carbs may cause high blood glucose levels or hyperglycemia very quickly. It is OK to eat small amounts of sweets and sugary foods occasionally but substitutions with diet soda and juices and sugar-free syrups/jams/jellies provide a sweet taste with very few carbohydrates or calories. Carefully counting all your carbs allows you to enjoy a small amount of sweets and still meet the goals for good glucose control.

Foods that are high in protein (meat, dairy products, and fish) and fat (butter, oils) contain little to no carbohydrate, but you should eat them in moderation to avoid weight gain and cardiovascular diseases such as heart attack and stroke.

How can I use carb counting to meet my blood glucose goals?

1. Eat a similar amount and type of carbohydrate at each meal and snack. Eating too many carbohydrates may raise blood glucose (> 250), but eating too little may cause low blood glucose (< 70)
2. Eat your meals and snacks at approximately the same time every day..
3. Keep the amount the same, but vary the type of carbs to avoid boredom and repetition.
4. Test your BG two hours after your meals to see how your body responds to the different foods that you eat. Since 90% of the starches and sugars we eat appear in the blood as glucose within two hours after eating, testing your BG two hours after eating a meal is just as important as testing it first thing in the morning.
5. Count the number (amount), not the type (simple or complex) of carbs you eat at each meal and snack. Counting the amount rather than the type is what makes carbohydrate counting such a flexible and easy method of meal planning.

How do I count carbs?

The food label is the best tool to help you count carbohydrates.

Count the number of grams of carbohydrate in a serving. Figure 1 on page 7 shows you how to calculate the number of carbs in a serving.

(continued on Page 7)

Research Opportunities for You

Do you have type 1 or type 2 diabetes?
Are you at least 18 years of age?
If so, you may be interested in participating in one of the following studies that are being conducted by the Diabetes Institute in the Walter Reed Health Care System. All of the studies are being conducted under the direction of Dr. Robert Vigersky, COL MC.

Is diabetes driving you batty? Perhaps this study is for you!

Seeking people who have had diabetes for more than 2 years to test the usefulness of a new diabetes questionnaire called the "Behavioral Assessment Tool" or BAT. The BAT was designed by a panel of health care experts in diabetes to help health care providers learn more about their patients with diabetes. It asks how you care for yourself and problems you may face in managing your diabetes. The study involves two visits to the Diabetes Institute at Walter Reed Army Medical Center. Each visit will require about 45 minutes of your time. You will be asked to complete questionnaires regarding your background information and your diabetes self care behaviors.
Contact Ms. Ginger Schmidt at virginia.schmidt@na.amedd.army.mil or 202.782.3308 if you would like more information or would like to participate in this study.

Diabetic Autonomic Neuropathy Study

The autonomic nervous system controls automatic functions in your body such as heart rate, blood pressure, and hormones. Diabetes increases the risk of developing complications in the autonomic nervous system which may increase the risk of heart attack, stroke, or death. The purpose of this study is to look for changes in your heart rate or blood pressure that may indicate damage to the autonomic nervous system and consequently, increase the likelihood of having a heart attack or stroke. The study involves 4 visits over a 3 year period of time. Each visit will require 30 to 60 minutes of your time and will be held in the Diabetes Institute at one of the clinics in the Walter Reed Health Care System.
Contact Mr. Todd Woods at todd.woods@na.amedd.army.mil or 202.782.3310.

Genetic Screening in Diabetes

Seeking people with type 1 or type 2 diabetes who have at least one of the following complications (retinopathy, neuropathy, or nephropathy) and have at least one living first degree relative. The purpose of this study is to determine if there are genes that might relate to the development of diabetes-related kidney, nerve, and eye complications. The study will require a telephone interview to determine study eligibility and one clinic visit that will take between 4 and 6 hours of your time. The clinic visit involves a blood draw for DNA and other laboratory tests, a physical examination, non-invasive procedures to evaluate the condition of the heart, eyes, and autonomic nervous system, and completing a questionnaire.
Contact Dr. Vlad Stanila at vlad.stanila@na.amedd.army.mil or 202.782.5226 if you would like more information or would like to participate in this study.

JVN Telehealth Eye Care

Diabetic eye disease is the leading cause of blindness among adults between the ages of 20 and 74, yet it is largely preventable with early detection and prompt treatment. The most common diabetic eye disease is retinopathy. The retina lines the inner surface of the eye and transforms the light rays into nerve signals that the brain interprets as vision. The Joslin Vision Network (JVN) system uses a digital camera to take pictures of the retina without dilating the eyes. The JVN system is as accurate as getting a dilated eye examination in an eye clinic. The purpose of this study is to determine the cost of performing eye exams with the JVN camera compared to the cost of the usual eye exam you would get in an eye clinic. Participants in the study will be assigned to one of two treatment groups. One group will receive an eye examination from an eye doctor and the other group will receive an eye examination with the JVN system. Both groups will be asked to complete two questionnaires at the beginning and end of the study. The study will last one year. The number of times you will be asked to visit the clinic depends on the treatment plan that your provider or eye care specialist gives you after your first eye exam. This may be from 1 to 12 visits. The time you spend for each visit will also depend on the treatment plan you receive after your first exam. The study will be conducted at

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All About You

The information you have may just save a life!!!

Carlyle P. Binns
Major USMC (Ret)

Shortly after I completed the Diabetes Self Management Education (DSME) class at WRAMC, I met with a vocational counselor to review my benefits as a veteran. We met at a McDonald's in Springfield, Virginia. Our conversation began casually and then the counselor asked more focused questions in order to identify more clearly my ability and areas of interest. I mentioned that I had diabetes, and he revealed to me that he had been a diabetic for over twenty years and was currently using an insulin pump to manage his diabetes.

When we finished our business our conversation turned to current and world events. Shortly into the conversation I noticed that he was acting strangely and not responding to my questions. A few moments later however, I became very concerned when he did not answer a question about purchasing his company's services.

I suddenly realized that he was most likely experiencing what I now call "diabetic distress." He was grimacing, his face was flushed, and he was struggling to speak. I stood up, put my hand on his shoulder, and asked him if there was something I could do to help. I also asked him if he wanted me to call 911.

With great difficulty, the gentlemen managed to grunt, "Coke." As I hurried to the counter, he again blurted, "regular Coke." That didn't register with me until later, but I complied with his request. When I reached the counter, I immediately went to the head of the line, and told a worker that I needed a coke for a diabetic who was in trouble. They did not seem to understand what I was saying and I contemplated going behind the counter and getting a cup myself! The counter help seemed more concerned about getting paid than helping!

I finally managed to get the coke and give it to my companion. Much to my relief he began to recover immediately. As we began to talk, the information I learned in class took on a new meaning. Perhaps my "takeaways" will help you if you ever find yourself in a similar situation:

- Hypoglycemia can occur very suddenly; the changes are sometimes very subtle.
- Hypoglycemia requires "real" sugar. Diet drinks will not help.
- Liquids are better than solid foods because they can get to the blood stream more quickly.
- Hypoglycemia can affect your ability to think and/or speak. A person whose blood sugar is low may not be able to help themselves or tell you how to help them.
- Know the signs. They may be subtle, but they are noticeable.
- Do not panic; you have some time. Even though I wasn't sure what to do, the information I learned in the DSME classes helped me to understand what was happening.
- Wearing a "medic-alert" bracelet instead of a necklace might make it easier to identify people who have diabetes.
- Insulin pumps are small and may look like a beeper or a cell phone. They may be your only indication that someone has diabetes.

Hand in Hand *(continued from page 4)*

Figure 1. Determining the number of carbs in a serving of food.

Nutrition Facts
Serving Size ½ cup (114g)
Servings Per Container 4

Amount Per Serving	
Calories 90	Calories from Fat 30
	% Daily Value*
Total Fat 3g	**5%**
Saturated Fat 0g	**0%**
Cholesterol 0mg	**0%**
Sodium 300mg	**13%**
Total Carbohydrate 13g	**4%**
Dietary Fiber 3g	**12%**
Sugars 3g	
Protein 3g	

Vitamin A	80%	Vitamin C	60%
Calcium	4%	Iron	4%

* Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:

	Calories	2,000	2,500
Total Fat	Less than	65g	80g
Sat Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Fiber		25g	30g

Calories per gram:
Fat 9 • Carbohydrate 4 • Protein 4

To find out how much carbohydrate is in a serving of food you are eating:

- Look at the serving size not the weight of the product
- Determine the number of servings per container and the amount of carbohydrate in each serving
- Look at Total Carbohydrates not the percentage (%)
- *You DO NOT have to count SUGARS separately*

Fiber and sugars are part of the total carbohydrates therefore do not count them separately.

OR

Select carb choices: 15 grams of carbohydrate = 1 carb choice (also referred to as carb unit or carb serving or exchange). Examples of one serving of carbohydrates include one slice of bread, a piece of fresh fruit about the size of a tennis ball, a small baked potato, or 1/3 cup of cooked rice or pasta

In summary....

Eating a variety of foods in the right amount will not only help you achieve and maintain good glucose, blood pressure, and cholesterol levels, it will help you to lose weight and feel better. Carbohydrate counting offers individuals with diabetes more flexibility and variety in their meal plans. Remember, one carb choice/serving = 15 grams of carbohydrates. For additional information on carbohydrate counting please schedule an appointment with your dietitian today!

Research Opportunities *(continued from page 5)*

WRAMC, Kimbrough, DeWitt, and Fairfax.
Contact Ms. Susan Walker at susan.walker@na.amedd.army.mil or 202.782.3314 for more information or if you would like to participate in the study.

Non-Invasive Glucose Monitoring

If you are on one or more insulin injections a day, you may be eligible for a study that will determine the accuracy of a new glucose meter that does not need blood to obtain a blood sugar reading. This new meter, which is called Nostix, will be compared to a standard glucose meter which requires a finger stick to obtain blood. The study involves one visit to the Endocrinology Clinic at Walter Reed where you will be monitored for 8 to 10 hours while you follow your usual daily diabetes care regimen. The Nostix glucose meter will be placed on the tip of one of your fingers. This device measures blood sugar by shining a low energy laser through the surface of your skin. It will remain in place for 10 seconds for each measurement during the study period. Using a standard laboratory glucose analyzer, a finger stick blood sugar will be obtained at the same time as each Nostix test. A total of 32 finger sticks will be obtained. Breakfast and lunch will be provided.
Contact Mr. Todd Woods at todd.woods@na.amedd.army.mil or 202.782.3310 for more information or if you would like to participate in the study.

Not sure which meal replacement beverage may be the best for you?

Studies exploring the use of meal replacements once or twice daily to replace a usual meal have shown that their use may result in significant weight loss. No studies, however, have explored the effects of selected meal replacements on post-meal blood glucose levels. This study requires a total of 5 visits each of which will last between 1-3 hours. You will be asked to drink 3 meal replacement supplements and the research officer will measure with a finger stick blood sample the effects of each meal replacement on fasting and post-meal blood glucose levels.
Contact Ms. Asha Jain at asha.jain@na.amedd.army.mil or 202-782-5625.

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Our Mission ▶ **Your Health**

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